

WR Operational Concept Document for the Digital Forecast Era: Priorities for the next 24 Months

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I. Introduction

A group of Western Region managers have identified significant issues regarding the continued implementation of IFPS in forecast offices. The team strongly emphasizes that the post IOC phase of IFPS must be treated as a transition period requiring sharp focus on the quality and coherency of grids and products, and on management of operational shift workload, while maintaining quality and proficiency in continuing programs.

VISION: NWS forecasters will effectively maintain situational awareness¹ and fully manage the forecast process during the transitional period from IOC to an end state digital forecast era. Further, the NWS will effectively develop and market the digital forecast database and derived products to our customers and partners so that these become the NWS's primary products.

II. Desired Forecast Process in the Digital Era

Forecasters are struggling with the paradigm shift from a forecast process that emphasized text-based forecasts to one that emphasizes a seamless digital forecast database. To facilitate this cultural change, IFPS needs to transition from a workload intensive system that inhibits forecaster situational awareness, to one that reduces workload and facilitates improved situational awareness. The time savings per shift will allow, depending on current weather, in-depth meteorological analysis, focus on key forecast issues, and training opportunities. The current digital forecast process must be streamlined by eliminating forecaster workload that adds little value to products and services. A robust verification program is critical for objective decisions on methods to streamline the IFPS process. Absent such a program, the following proposed changes to the current forecast process are based on forecast office experience and are critical for success in the digital forecast era.

A. Freeze the number and resolution of grids at current IOC requirements

It is imperative that no additional grid requirements be placed on forecasters beyond current IOC specifications for the transition period. Current limitations in: (a) grid initialization (lack of high resolution model guidance or climate data for providing diurnal trends), (b) grid editing tools (including smart tools), (c) efficient collaboration methods, and (d) robust formatters,

¹ Forecasters are proactively monitoring ongoing weather to issue warnings, advisories, outlooks, updated forecasts, and are relaying this information to emergency responders with adequate lead time to protect life and property. Situational awareness is critical to the NWS vision of a No Surprise Weather Service.

seriously limit the forecaster's ability to produce quality digital or text forecast products in a timely manner.

B. NCEP products and services in the digital forecast era

NCEP can and should play an important role in the digital forecast era. First, Service Center products that alert field offices to potential hazardous weather can effectively enhance forecast office situational awareness. Second, field office situational awareness can also be significantly improved if the Service Centers facilitate collaboration and consistency between forecast offices by leveraging and sharing their expertise through development of new guidance processes (e.g. Winter Weather Experiment). These new processes would incorporate the latest EMC model developments such as short and medium range ensemble predictions, giving the forecaster a "best" solution and providing an objective measure of uncertainty. NCEP Service Centers have the potential to become the scientific leaders in this area. Third, utilizing the consensus "best" solution, EMC should develop methods to create and downscale bias corrected sensible weather grids that will allow the field to populate the digital database at spatial and temporal resolutions sufficient to meet the projected needs of the NDFD. These efforts should be facilitated through the newly developed ISST.

C. Improve grid quality and coherency

Key issues need to be addressed for improved grid quality and coherency. These include: (a) verification of quality/coherency of forecast grids (requires analysis of record) (b) improved grid initialization options, (c) improved smart tools, (d) implementation of best practices, (e) improved collaboration methods, and (f) incorporation of satellite, radar, and surface observations in GFE to expedite quality short-term updates. The most recent SOO/DOH IFPS White Paper addresses many of these issues and establishes methods to implement these from a national perspective. Regionally, some of these goals may be attainable through Regional Teams. These teams have the potential to address and facilitate implementation of most of the items listed above, with the exception of incorporating new data sets into GFE. The White Paper goes on to stress the application of solid meteorological science as the foundation for attaining quality and consistency in the digital forecast era. The efficiency of the digital forecast process must be dramatically improved so sufficient priority can be placed on training time in forecast offices.

D. Reduce forecaster workload in post-editing text products

During ORD, forecasters spent a significant portion of their shift post-editing text formatter output. To date, most national support has focused on improved formatters, yet the forecaster has realized little time savings in generating text products that meet both forecaster and directive requirements. This contributes to two problems. First, forecasters may compromise grid quality to compensate for formatter deficiencies (compromise grids to achieve wording), and second, valuable time is not available for detailed meteorological analyses, adequate situational awareness, and assuring grid coherency with neighboring offices.

NWS Directives, particularly 10-503, need to be modified to simplify text requirements and to

reduce emphasis on traditional routine text products. In addition, directives must emphasize the digital forecast database as the primary NWS product from which most products will be derived. Further, as recommended in a later section, a customer base must be developed quickly so the digital database is the primary NWS product.

The requirement for a continuously current digital database needs to be revised. During rapidly changing meteorological conditions, it is often impossible to update the local forecast database in less than an hour. A common practice is to update the text forecast (generally first or second period), followed by an attempt to edit grids to match text. This process is inefficient and creates significant additional workload and results in consistency/coherency problems in the NDFD. NDFD requirements should be modified to establish a six hour currency interval, and divorce interim text product updates from the digital database. Advertising the NDFD as “always current” could be reestablished after the transition period as formatters and smart tools become more sophisticated.

III. Desired IFPS Forecast Process Outcome

The traditional link between forecaster workload and service has become tenuous as the forecast process has rapidly transitioned from a primarily text based product suite to generation of a digital forecast database. Forecasters spend considerable resources generating the digital forecast database but perceive little corresponding benefit in terms of workload and service. To remain relevant and to strengthen the link between workload and service, there must be a concerted effort to demonstrate to forecasters that a customer base exists for the digital database and that text products can be de-emphasized. To achieve this goal, the team identified three areas for change to the current process:

A. Maximize use of the digital database by defining a customer base and service needs

The workload and complexity involved in creating a seamless high quality digital forecast database is monumental and growing. Therefore it is critical that this effort is validated by identifying current and potential customers of the digital forecast database and how they use or will use it. This process needs to include groups that are recognized as primary users of NWS products, i.e., emergency managers, business leaders, media outlets, other governmental agencies, and our partners at the national, regional and local levels. This effort must be accomplished by all organizational levels of the NWS from headquarters to the local forecast office. In particular, it should be a primary focus of WCMs during the transition. Forecaster workload should be driven by customer demand as the contents of the digital forecast database are tailored to provide relevant products and services.

B. Establish a product development program for the digital forecast database

The forecast process must continuously evolve to meet changing customer requirements for products and services. To meet changing customer needs, we must collaborate with groups that utilize the digital forecast database to obtain critical feedback. Collaboration must occur at all

levels (including the local forecaster) and must address the science, technology, utility, quality and consistency aspects of the digital forecast database. Feedback must then be incorporated into product development and technology transfer programs designed to enhance products and services. The collaboration process needs to integrate the entire end-to-end forecast process and involve both internal and external customers and partners. Development of new products and services can and should occur at all levels to meet individual customer needs. For example, NWS Information Technology Officers (ITO) could team up with the ITO or GIS experts of local customers to research and develop grid enhancements and GIS applications. The combined effort would lead to improved services for all customers.

C. Establish a product marketing program to emphasize the digital forecast database

The digital forecast database provides customers at all levels the flexibility and potential to develop innovative ways to display and utilize our products and services. At present, the digital database is underutilized. Potential customers may not be aware this database exists, may not have applications to leverage its utility, or may not realize its potential benefits. A vigorous outreach effort is needed to promote the digital forecast database through marketing to our partners and customers at all levels. Current applications must be provided to customers and partners and enhanced as needed to facilitate access to and use of the digital forecast database. Forecasters, WCMs, ITOs, and others involved in customer outreach should provide critical consultation services as our customers transition to use of the digital forecast database and discontinue use of traditional text-based products. Direct forecaster involvement with customers also reinforces the importance of the digital forecast database and provides valuable feedback as they transition from word processing to grid processing. This direct interaction between forecasters and customers would result in improved warning and forecast services, and provide motivation for transition to a complete digital forecast era.

IV. Summary

In the past two years, the NWS has made great strides in making a national digital forecast database a reality. However, ORD demonstrated that the digital forecast process and IFPS are far from mature. To ensure that WFOs succeed over the next few years as technical shortcomings are addressed (see SOO White Paper, etc.), we strongly recommend the following be adopted as the post-IOC focus of NWS management.

- temporarily freeze official grids at IOC levels until a robust verification system is implemented
- make NDFD grids “current” at six-hour rather than one-hour intervals
- identify and implement NCEP products that enhance WFO situational awareness through collaboration and reduced forecaster workload
- deploy regional teams to improve IFPS at all WFOs
- reduce forecaster workload in post-editing text products
- engage customers to use of the digital database and ensure service needs are met
- establish a product development program nationally, regionally, and locally
- establish a product marketing program that can be used by all WCMs